Major Air Pollutants

The measurements for air quality in Missouri are the National Ambient (outdoor) Air Quality Standards established by EPA under the Clean Air Act. The standards address six "criteria pollutants" considered harmful to public health and the environment: ozone, lead, inhalable particles, carbon monoxide, nitrogen dioxide and sulfur dioxide. These standards are found on page 11.

Ozone

Ground-level **ozone** is a colorless gas, the most harmful part is sometimes call "smog." **Ozone** is not directly emitted. It forms on hot, stagnant summer days when sunlight causes a reaction between volatile organic compounds (VOC) and **nitrogen oxides (NO_x)**. Vehicles, power plants and industrial boilers are common sources of **NO_x**. Gasoline-powered vehicles and manufacturing operations are major sources of VOCs.

There are two types of **ozone**: stratospheric (upper atmosphere) and ground-level **ozone**. **Ozone** in the stratosphere occurs naturally and is desirable, shielding the earth from harmful ultraviolet rays. **Ozone** at the ground level irritates the respiratory system, causing congestion, chest pains, nausea and labored breathing. It also aggravates existing lung and heart conditions such as asthma.

Airborne Lead

In Missouri, airborne **lead** and its compounds are produced mainly by **lead smelters**. Airborne **lead** poses the greatest danger to children under age six, therefore the standard has been established to protect their health. In 1985, 73 percent of airborne **lead** came from vehicle exhaust pipes. By 1988, it decreased to 34 percent due to federal controls on gasoline that started in the mid-1970s.

Inhalable Particles

Inhalable particles include airborne dust, pollen, soot and aerosol sprays. Scientists also refer to these as "particulate matter." Current federal standards apply to particles less than 10 microns in diameter, or **PM_{10}**, emitted mainly by vehicles, industry and farms. Wind and rainfall cause seasonal variations in **PM_{10}**. In 1997, EPA set new standards for even smaller particles less than 2.5 microns in diameter, or **$PM_{2.5}$**.

Carbon Monoxide

Carbon monoxide (CO), formed by the incomplete combustion of fuel, is one of the most common pollutants. More than 75 percent of **CO** emissions come from vehicle exhaust. The highest concentrations are caused by heavy traffic in metropolitan areas. Though deadly, **CO** changes quickly to carbon dioxide, which is not dangerous.

Nitrogen Dioxide

Almost all **nitrogen dioxide (NO_x)** is man-made. When fuel is burned above 1200 degrees Fahrenheit**,** **nitrogen dioxide** can form. Principal sources of **nitrogen dioxide** include power plants, industrial boilers and vehicles.

Sulfur Dioxide

Sulfur oxides form through the burning of fuels that contain sulfur, such as coal and oil, by **smelting** metals and by other industrial processes. **Sulfur dioxide (SO_2)** composes about 95 percent of these gases.

Other Air Pollutants

In addition to the six criteria pollutants, the Department of Natural Resources' Air Pollution Control Program also regulates other pollutants, including asbestos and hazardous air pollutants.

Asbestos

Asbestos is a naturally occurring mineral that takes the form of hollow microscopic fibers. Before being identified as a cancer-causing agent, asbestos was widely used for insulation and fireproofing. With age, it breaks down and becomes a hazard to anyone who breathes its airborne fibers. Federal and state laws regulate the removal of asbestos from buildings and the Department of Natural Resources monitors these activities.

Hazardous Air Pollutants (HAPS)

Some air pollutants can cause quick and painful death, cancer, reproductive disorders and environmental damage such as acid rain. EPA has designated these pollutants as hazardous air pollutants. These pollutants may present a hazard to public health and safety if released in sufficient quantity.